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AMERICAN POTATO JOURNAL

PUBLISHED BY

THE POTATO ASSOCIATION OF AMERICA

EAST LANSING, MICHIGAN

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Notes on Sprout Tuber or No-Top Potatoes

H. C. MOORE, Michigan State College, East Lansing, Michigan

In May and June many Michigan growers reported poor stands, resulting from the seed pieces developing small tubers without normal sprout or plant growth. In some instances, stands were reduced 50 percent by this abnormal condition which has been termed sprout tuber by Weiss and Brierly and blind or Kindel tuber by Wellensiek. In Michigan this trouble has generally been called no-top potatoes. It was of some economic importance in Michigan in 1918 and a few instances of it have been observed in later years. Its development in 1931, however, is believed to be the most pronounced of any yet occurring in this state.

Experimental work conducted by Wellensiek of Germany and Weiss and Brierly of the United States Department of Agriculture showed that water loss from the tuber was a sufficient factor to promote the sprout tuber or no-top condition. In their experiments excessive water loss was brought about by repeated sprouting of the tubers; by storing the potatoes in a warm cellar and by planting in a cold dry soil. Weiss and Brierly found that warm storage (60°) with the removal of one or two sets of sprouts before planting produced sprout tubers when the seed pieces were planted in a dry soil that was 40° - 50° F. However, no sprout tubers occurred when the seed was planted in a warmer soil of 55° F. or higher temperature. Green Mountain and Irish Cobbler varieties were used in the tests. The Green Mountains proved the more sensitive to unfavorable conditions and produced more sprout tubers than did the Irish Cobblers.

The incidence of hot dry weather late in the season when the potatoes mature is believed to be one of the most important causes of sprout tuber or no-top potatoes, though experimental evidence of this factor seems to be lacking at the present time. Wellensiek, Weiss and Brierly expressed this belief and observations made in several sections of the country where sprout

tuber has occurred sustain it. McCubbin attributed the occurrence of sprout tubers in Pennsylvania in 1923 to hot weather the preceding year. The development of sprout tubers or no-top potatoes in Michigan in 1918 was believed to have resulted from the crop having ripened prematurely in August and September as a consequence of dry weather. The deficiency in rainfall for these months being .41 and 1.10 inches respectively.

Observations of the no-top trouble in Michigan in 1931 indicate that it is most severe in those sections where drought was the most serious in September 1930. No reports of sprout tuber were received from the Upper Peninsula and only one report from the two northern tiers of Lower Peninsula counties. The average rainfall for the Upper Peninsula in September 1930 was 3.31 inches or 0.20 inches below normal. For six weather bureau stations in representative areas of the two northern tiers of counties, the average rainfall in September was 2.83 or 0.24 inches below normal.

Approximately 80 reports of sprout tuber were received from Osceola, Wexford, Mecosta, Montcalm, Lapeer and Ionia counties. The September rainfall for these counties averaged 1.43 inches or 1.65 inches below normal. The September average mean temperature for the Upper Peninsula was 1.1° above normal; 0.5° above normal for the two northern tiers of counties and approximately 2° above normal for the six counties listed.

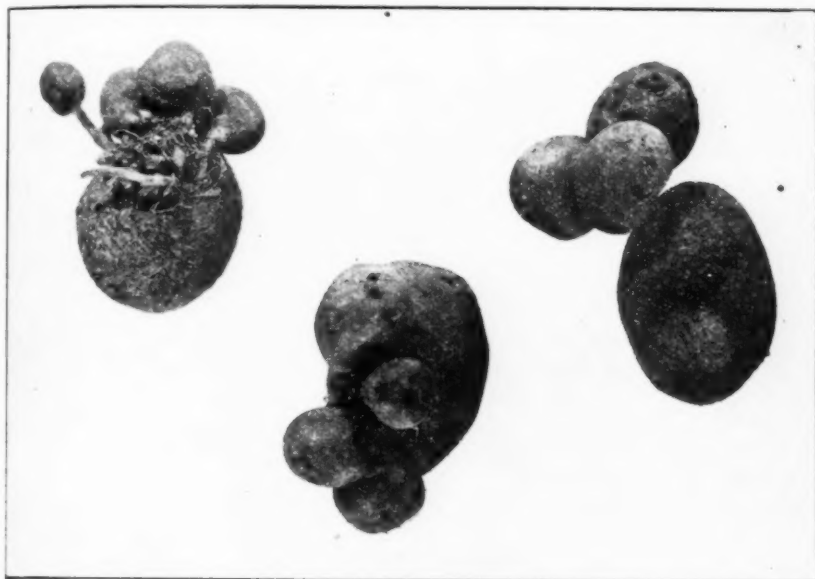
In August there was a deficiency in rainfall throughout the state of about 2 inches. The mean average temperature was 1.8° above normal for the Lower Peninsula and 3° above normal for the Upper Peninsula. Apparently the predominance of sprout tuber in some areas cannot be attributed to August weather conditions. In July there was a general deficiency in rainfall in most sections of the state approximately 1 inch below normal for the Upper Peninsula and the two northern tiers of counties and approximately 2.25 inches below normal for the remainder of the state including the six counties above listed. Temperature varied but slightly from normal for the different regions of the state.

Excessive drought in July in some sections of the state promoted abnormal plant and tuber growth. In many cases new tubers produced weak sprout growth from the apical buds. In other instances tuber bearing stolons grew 12 inches or longer and terminated by producing a plant. It is also believed that drought in July enhanced the development of sprout tuber or no-top potatoes. Another abnormal condition in tubers grown in the severe drought areas was internal brown spot. This trouble was serious enough in many instances to cause the rejection of the potatoes on the market.

Sprout tuber or no-top seemed most severe in lots of potatoes that were grown on very light, humus deficient soils. Internal

brown spot injury was also more common in potatoes from the poorer soils. It was noted that even in the worst drought affected areas that little no-top or internal brown spot injuries were reported by growers who produced potatoes on fertile, well prepared soils. Generally the best yields and best quality potatoes were produced in 1930 on fields plowed the previous fall or very early spring and that were kept well harrowed previous to planting so that soil moisture was conserved. Furthermore, the plowing under of organic matter such as alfalfa or sweet clover sods and well rotted stable manure reduced materially the sprout tuber and internal brown spot troubles.

In addition to good soil conditions proper storage of the seed is necessary for normal sprout development and satisfactory



Three seed potatoes removed from the soil showing sprout tuber or no-top trouble.

stands. Several instances of the sprout tuber trouble resulting from poor storage have been noted in Michigan during the past few years. Growers are advised to keep seed potatoes at a uniform temperature of 36° - 40° F. and to provide adequate ventilation for the stored seed.

The practice of green sprouting seed potatoes has generally given satisfactory results in Michigan. Removing the potatoes from storage about two weeks previous to planting, treating

them with corrosive sublimate and spreading them out on the floor of a barn or room where they will be exposed to light promotes the growth of vigorous green sprouts on healthy tubers, and is an aid to the grower in discarding potatoes that develop weak sprouts or those that are abnormal.

The prevention of sprout tuber formation was accomplished in experiments conducted by Denny of Boyce Thompson Institute. Garnet Chili potatoes were soaked 24 hours in one per cent and three per cent solutions of sodium thiocyanate and thiourea. The tubers were then cut into pieces and planted in flats. The check lots were soaked in water instead of chemical solutions. The chemically treated seed produced a good growth of tops and with few exceptions formed no sprout tubers. The seed soaked in water produced sprout tubers under ground and only rarely produced a sprout above ground. Based on Denny's experiments it is probable that practical control methods may later be evolved for the prevention of sprout tuber.

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Potato Rotations and Fertilizer Program

E. V. HARDENBURG, Vegetable Crops Department, Cornell University, Ithaca, N. Y.

Most potato growers consider rotation an essential to successful production. Among the advantages claimed are reduced danger of exhausting the soil of specific nutrients by a single crop, better distribution of root systems throughout the surface soil, less danger of accumulation of toxic substances, maintenance of better tilth, less trouble with soil inhabiting insects and disease organisms, and better labor distribution. Clover and other less

commonly used legumes long have been recognized as most valuable sources of humus and nitrogenous organic material for the potato rotation. But the fact remains that thousands of successful potato growers along the Atlantic seaboard today do not find it either necessary or practical to rotate with these legumes under present economic conditions. These growers are maintaining potato yields by deriving their organic material from rye and other green manure crops and by the annual application of 2,000 to 3,000 pounds of commercial fertilizers.

A recent study of potato rotation and fertilizer experiments published from many experiment stations in this and other countries indicate that field and vegetable crops may or may not require rotation depending on the degree to which they respond to fertilization. In brief, those crops which respond most to fertilizer application are least benefited by rotation. Among such crops are listed potatoes, mangels, rutabagas, cotton and tobacco. We may conclude, therefore, that so long as soil organic matter can be maintained through the use of green manure crops it is not always necessary or even desirable to grow potatoes in an established rotation.

Soil Reaction and Cropping Systems

Soil reaction or soil acidity studies in relation to yield and the incidence of certain vegetable diseases recently have led to certain new ideas in respect to our system of cropping. For example, certain of our commonly rotated crops are very sensitive to soil acidity while others are broadly tolerant. Potatoes, corn, beans, tomatoes, peas, soybeans, buckwheat and rye are in the latter group. In contrast alfalfa, sweet clover, beets, cabbage, onions and spinach do not ordinarily yield well in strongly acid soils.

In several counties of western New York, both potatoes and cabbage are important cash crops and it is customary to grow both in the same rotation. Where the soil is highly acid, the club-root disease of cabbage may be troublesome since this disease is favored by an acid soil reaction. On the contrary if the soil is alkaline, neutral or even slightly acid, potato scab may be serious, especially in dry seasons. One can readily understand, therefore, that if lime is applied to control club-root, this treatment may lead eventually to trouble with potato scab. Vice versa, if acid forming fertilizers such as ammonium sulphate are applied to control potato scab, this may lead to the club-root problem. Here is a possible situation in which it may be highly desirable to set up two independent cropping systems or rotations, one in which potatoes may be rotated with such crops as beans, cereal grains, cannery crops excepting beets, rye, soybeans, and alsike clover. These crops will apparently yield well in moderately acid soil or soils in which the pH values range from 5.0 to 5.8. Other crops such as alfalfa, sweet clover, red

clover, cabbage and beets less tolerant of acidity may well be grouped in a separate rotation and grown on fields better supplied with lime.

Better and Cheaper Fertilizers

The use of more and better commercial fertilizer where it will result in profitable increase in yield is one of the best ways of meeting the prospect of lower potato prices in 1931. Fertilizers in general are cheaper now than they have been in many years due largely to the introduction of synthetic forms of nitrogen and competition within the manufacturing trade. According to the February 1931 issue of Fertilizer Economics, sulphate of ammonia and superphosphate are now cheaper than they have been at any other time in ten years. Muriate of potash is cheaper than it was before the World War, while sulphate of potash is higher. Since potato yield and quality tests have shown no preference between the muriate and the sulphate forms of potash and since muriate averages at least \$10 a ton less cost, the latter is most widely used in potato fertilizers at present.

Soil Reaction and Fertilizer Ingredients

As previously indicated, the potato plant is broadly tolerant of soil acidity. Under Long Island conditions, it has been demonstrated that maximum yields can be obtained in soils which are even more acid in reaction than that which usually favors the development of potato scab. On sassafras silt loam soil, highest yields were obtained within a range of pH 5.2 and 5.6 while scab did not become a serious factor until the pH values reached approximately pH 5.8. These facts, although pertinent to Long Island conditions, may not apply the same to our heavier soil type upstate and here may only indicate the approximate relationship between soil reaction, yield, and the incidence of scab. However, where potato growers had serious difficulty with scab in 1930, they should avoid using the same soil in 1931 and see to it that the principal source of nitrogen is sulphate of ammonia which tends to increase soil acidity. Most of the fertilizer concentrates such as the Nitrophoskas now on the market are said to be neutral or slightly acid in reaction. The use of inoculated sulphur to control scab is recommended only in extreme cases. It may be obtained from Mechling Brothers, Camden, N. J. When sulphur is applied, it should be with due regard to its possible depressing effect on other crops in rotation. Small scale trial applications of sulphur are suggested rather than general applications.

Home-Mixing Potato Fertilizer in 1931

Home-mixing may result in a worthwhile saving to some of our larger growers who can buy the ingredients in carlots. Where standard analyses such as 5-10-5 or 4-12-4 are used and the

mixture applied shortly after mixing the ingredients may well be ammonium sulphate, 16 per cent or 18 per cent superphosphate, and muriate of potash. If the mixing is done several weeks before planting, the problem of mechanical condition or durability of the fertilizer should be taken into account. Ammoniated superphosphate analyzing 2-17½-0 may well provide this desirable condition. Other brands of superphosphate which do not absorb moisture on standing are also now on the market. Where double and triple strength mixtures are to be home-mixed, it is necessary to derive at least part of the nitrogen and phosphoric acid from such ingredients as ammo-phos, urea, cyanamid, and 40 per cent superphosphate.

For home mixing a 5-10-5 potato fertilizer, the ingredients may well consist of one-half ton of ammoniated superphosphate (2-17½-0) plus 320 pounds of ammonium sulphate, plus 156 pounds of 16 per cent superphosphate plus 200 pounds of muriate of potash. Ammoniated superphosphate as a base for this mixture gives the advantage of good mechanical condition as well as a cheap source of nitrogen and phosphoric acid. For home mixing a 10-20-10 fertilizer it is necessary to use more concentrated sources of nitrogen and phosphoric acid. For this, the ingredients may consist of 800 pounds of ammo-phos, 160 pounds of ammonium sulphate, 600 pounds of 40 per cent superphosphate, and 400 pounds of muriate of potash.

Cultivation Experiments With Potatoes on Long Island¹

¹Reprinted from Proc. Potato Assn. of Amer., 17th Annual Meeting, Dec., 1930.
H. C. THOMPSON and P. H. WESSELS, College of Agriculture, Ithaca, N. Y.

During the past four years a cultivation experiment with potatoes has been in progress on the Long Island Vegetable Research Farm near Riverhead, New York. This experiment is a part of a series of experiments with vegetable crops that has been under way on Long Island for eight years. The soil of the area used is classed as sassafrass silt loam.

A cover crop of rye was grown on the land every year, and in addition, an application of about 10 tons of manure was made each spring. The fertilizer treatment consisted of 1,200 pounds of a 5-8-5 fertilizer per acre, applied broadcast after the land was plowed.

Plan of the Experiments

The area used for these experiments is laid out into six

blocks of equal size so that six different crops may be grown every year. The crops are rotated on these blocks. Each block is divided into plots one rod wide and two rods long, containing one-eightieth of an acre. The treatments given are: (1) cultivation about once a week until the vines interfere with the work; (2) cultivation during half of the season; (3) scraping the surface to control weeds without forming a soil mulch and, (4) no cultivation or scraping—weeds allowed to grow. All treatments are in triplicate, except the last-mentioned one, which was not replicated. The cultivated plots were cultivated by hand with a Planet Jr. cultivator, or with a small garden tractor. The scraped plots were scraped about once a week with a sharp hoe to cut off the weeds without forming a mulch. The object of the scraping was to determine the value of a soil mulch. The weeds were eliminated as a factor in both the cultivated and scraped plots so that a comparison of these shows the effects of a soil mulch on yield.

Each plot was planted to six rows, but only five rows were harvested for record, as the sixth one was the buffer row between two treatments. The Irish Cobbler variety was grown in 1927, 1929 and 1930 and the Green Mountain in 1928. The seed was cut in the usual manner and was planted by hand, 15 inches apart in the row with the rows three feet apart. The planting dates were April 16, 1927; April 26, 1928; April 18, 1929, and April 15, 1930.

TABLE 1.—Average Yield of Potatoes in Bushels per Acre for Each Year and the Four-Year Average.

Year	Cultivated all season	Cultivated half of season	Scraped	Weeds allowed to grow
1927	159.00	160.66	170.22	93.33
1928	246.26	258.93	271.60	60.93
1929	130.13	129.33	139.46	92.00
1930	255.73	253.33	265.73	34.66
Avg.	197.53	200.56	211.75	70.23
Odds		None	100:1	20:1

The plots given cultivation throughout the season were cultivated nine times in 1927, eight times in 1928, nine in 1929, and seven times in 1930. The last cultivation of these plots was given on August 4, 1927; July 12, 1928; July 24, 1929, and June 28, 1930. Those selected for cultivation half of the season were cultivated four times in 1927; six times in 1928, five in 1929, and six in 1930. There was not as much difference be-

tween the two cultivation treatments in 1928 and 1930 as was desired, but growth was so rapid in those years that cultivation had to be discontinued earlier than was contemplated.

Experimental Results

The results of these experiments are shown in Table 1, which gives the yield data computed in bushels per acre, including the average yield for each year and for the four years. The odds of significance, calculated by Student's method and using Love's¹ modification of Student's table, are also given.

The data given in Table 1 shows that there is no significant difference in yield between the two cultivation treatments. This indicates that cultivation after the plants are nearly full grown may not be of any particular value. Comparison of the yields on the cultivated and scraped plots shows that maintaining a soil mulch was of no value. In fact, the scraped plots produced larger yields than the cultivated plots every year and the odds of 100:1 show that the difference is significant. In the four years there were 12 actual comparisons and in 11 of these the yield on the scraped plot was higher than that on the comparable cultivated plot. This indicates that maintaining a soil mulch by cultivating was of no value, or else that cultivation was injurious at times due to root destruction or to other factors, and offset any advantage that might have been derived from mulch. Thompson² has shown that stirring the soil sometimes results in loss of moisture, especially when cultivating is done soon after a light rain.

The yield of potatoes on the weed plot was slightly over one-third of that on the cultivated plots, but since there were only four comparisons, the odds are low. With a larger number of operations the odds undoubtedly would have been much higher. It is of interest to note that the weeds did the greatest damage when soil moisture and other ecological factors were favorable for the growth of potatoes, especially when these conditions were favorable early in the season, as in 1928 and 1930. This might be expected since weeds as well as potatoes thrive under favorable conditions. When weeds get a start early in the season they have a greater effect on crops than when they start after crop plants are well established.

The potatoes grown under all of the treatments were of low market quality, due to sunscald and to greening. This is explained by the fact that the ridges were leveled down soon after planting and flat culture was practiced thereafter. Flat culture is not recommended, but was necessary in this

¹Love, H. H. A modification of Student's table for use in interpreting experimental results. *Amer. Soc. Agron. Jour.* 16:68-73. 1924

²Thompson, H. C. Experimental studies of cultivation of certain vegetable crops. *Cornell Univ. Agr. Exp. Sta. Memoir* 107. 1927.

experiment since it is not possible to keep up the ridges without stirring the soil between the rows. This was not desired in the scraped plots and, of course, all plots had to be treated alike in all respects except for the cultivation treatment.

Summary and Conclusions

1. Results obtained in an experiment carried on for four years on a sassafras silt loam soil on Long Island show that maintaining a soil mulch by cultivation was of no value. In fact, where weeds were controlled by scraping, the yields were consistently larger than where shallow cultivation was given throughout the season.

2. Cultivation during the latter part of the growth period was of no value and was an unnecessary expense. Plots cultivated four times in 1927, six times in 1928, five times in 1929 and six times in 1930 produced as large yields as comparable plots cultivated nine, eight, nine and seven times respectively.

3. The yield on the weed plot was only about one-third as much as on the cultivated plots, but due to the small number (4) of comparisons and the great variation in yield the odds are low.

4. It seems safe to conclude that if sufficient cultivation is given to control weeds one need not give much consideration to the soil mulch on silt-loam and lighter soils.

5. The best time to control weeds is before they have become established for at this time they have not done much damage and they can be eradicated by shallow cultivation.

Crop and Market News

First Production Forecast for 1931

(Contribution from Bureau of Agricultural Economics)

The indicated total production of potatoes for 1931 is approximately 396,000,000 bushels, compared with 343,000,000 in 1930 and the recent five-year average of 381,000,000 bushels. The sweet-potato crop may be about one-fifth larger than that of last season, or about 74,100,000 bushels.

The acreage of Irish potatoes planted this year is estimated at 3,506,000 acres, compared with the revised estimates of 3,167,000 acres grown in 1930. This represents an increase of 10.7% over the 1930 acreage or a somewhat larger percentage increase than was expected from the March intention report of growers. The increases over acreage intentions occur chiefly in the Central States, northern and southern. The northeastern

states have only slightly exceeded their earlier expectations, while the Western and South Atlantic states partially reduced their plans for increase.

Condition of the crop on July 1 was reported to be about the same as on that date a year ago and only a little below average. According to the July 1 condition reports, the crop this year appears likely to make about 396,450,000 bushels, barring unusual circumstances prior to harvest. This would be at least 15% larger than the crop of 1930, the revised estimate of which is approximately 343,200,000 bushels. Yields are expected to average somewhat higher than last year over the country in general but in some areas, principally in the west and some central states affected by the recent heat wave, yields are not likely to equal those of 1930. In the deficient producing states, both eastern and central, conditions do not point to the possibility of very much higher yields than in 1930. Because of acreage increases, all but a few of the central states will probably have larger crop than a year ago, in spite of low yields. In the western states, however, production is generally expected to be much lower than in 1930, averaging nearly 13% less for the group of states. Shortage of moisture and irrigation water is the principal threat to higher yields in many of these states.

The 19 surplus-producing states expect 38,000,000 more bushels than last year, and the 16 deficient-producing late states an increase of nearly 6,000,000 over their 1930 crop, as shown in the following tabulation:

POTATOES: Acreage and Production, 1930, compared with July 1 Indications, 1931, by Groups of States.

Group	Acreage		Yield		Production	
	1930	1931	1930	1931	1930	1931
	1,000 Acres		Bushels		1,000 Bushels	
United States	3,167	3,506	108.4	113.1	343,236	396,451
35 Late States ..	2,753	3,010	111.4	116.2	306,569	349,880
19 Surplus	2,045	2,250	115.0	121.5	235,078	273,282
4 Eastern ...	597	639	153.4	161.6	91,551	103,261
6 Central ...	1,055	1,176	69.6	92.5	73,413	108,775
9 Western ...	393	435	178.4	140.8	70,114	61,245
16 Deficient ...	708	760	101.0	101.5	71,491	77,108
8 Eastern ...	232	241	133.4	136.1	30,951	32,807
8 Central ...	476	519	85.2	85.4	40,540	44,301
13 South Sta's ..	414	496	88.6	92.9	36,667	46,061

During the second week of July, when Eastern Shore of Virginia was approaching its peak and when Kansas and Mis-

souri were becoming active, total shipments increased to almost 1,000 cars daily, but about the middle of the month a slight decrease occurred. The North Carolina season has closed with a record of 8,700 cars shipped. Oklahoma ran shorter than last year and forwarded scarcely 2,300 cars. Louisiana was credited with a large total of 4,400, but Texas with a moderate total of 5,000 cars.

Toward the middle of July, the Eastern Shore of Virginia was moving 600 cars of potatoes daily, while Norfolk section had decreased to 100 each day. Maryland was becoming active, and Missouri and Kansas had each increased to 50 cars daily. The crops in these midwestern sections will be relatively lights, and considerable portion will be of inferior quality.

Shortly after the North Carolina season closed, eastern shore potatoes advanced to top of \$2 per barrel, but by July the f. o. b. range had declined again to \$1.70-\$1.75. Sacked Cobblers in Kansas and Missouri were returning \$1.20-\$1.40 per 100 pounds, with Chicago carlot sales of Missouri stock ranging \$1.25-\$1.40. The general city jobbing price of best Eastern Shore Cobblers was \$2-\$3.50 per barrel. Kentucky potatoes were starting the season in Cincinnati at \$1.65-\$1.75 per 100-pound sack. Midwestern Bliss Triumphs jobbed in several markets at \$1.90-\$2.

Chicago "futures" for October delivery strengthened slightly, with Idaho Russet Burbanks averaging \$1.54 per 100 pounds and Round Whites bringing \$1. Maine Green Mountains, for October delivery in Boston, ruled \$1.12 on the Chicago exchange.

Notes

NEW YORK

The closing days of June are always attractive days over the route of the Sunrise Trail. Long Island potato growers have appropriately capitalized the words "Sunrise Trail" and these words have come to mean automobile tours, community picnics, bathing parties, mock trials, and miles of beautiful potato fields in full bloom. The Nassau and Suffolk County farm bureaus cooperated this year again in a three-day potato tour on June 24-25-26. Four factors conspired to make this tour probably second to none yet held; the weather, the program, the wonderful condition of the potato fields throughout the Island, and the attendance.

Field stops provided most of the instructive features as college and station experts from various states and provinces "talked shop" in relation to seed source tests, fertilizer tests,

spraying experiments, and machinery demonstrations. Fourteen years ago when the first tour was held these seed source demonstrations were the principal center of interest. Then, certification of seed was a new project and the aim was to search out seed containing the least disease. Even the best seed contained 10 to 15 per cent mosaic and leafroll. Today, as a result of 16 years of effort on the part of the seed growers and seed inspectors it is exceptional to find a strain of seed from any one of eight or 10 states and provinces containing over two to three per cent of virus disease. Yet the Long Island grower never puts his eggs all in one basket. He can't afford to take chances. It is the usual practice to plant seed from at least three or four sources. Most of this seed now originates in New York, Maine and Prince Edward Island. Some of it comes from Vermont, Wisconsin, New Brunswick and Nova Scotia.

Long Island potatoes are second to none in quality in this country. They market at a premium price over those from any other single section. Some day the Long Island grower will market a large per cent of his crop in small fancy packages. The tour this year witnessed at Mattituck a demonstration of grading and packaging into 15-pound fancy sacks. A large motorized machine which automatically grades, weighs, sacks and sews up such package was the center of attraction. Another new feature this year was a field demonstration of about 40 potato machines at Cutchogue. Here were tractors, plows, cultivators, harrows, seed cutters, planters, sprayers, dusters and diggers, most of them in operation.

An idea of the widespread reputation of the Long Island tour may be gained from the fact that among the 300 odd people in attendance were visitors from New Brunswick, Quebec, Prince Edward Island, Maine, Vermont, Connecticut, Pennsylvania, New Jersey, Maryland, Washington, D. C., Virginia, California and Poland. Reports of the condition of the crop given by these visitors were in every case favorable except for Virginia. Eastern Shore of Virginia reported prospect for a crop of 12,000 cars instead of the 17,000 cars shipped last year. The Long Island crop never looked more promising at this time of year. Since the acreage there has been increased five to eight per cent it now looks as though 1931 would be a record crop year for the Island. Altogether potato growers are feeling optimistic as to crop but pessimistic as to price. Maine reports prospects for a record crop after recent rains which will force rapid growth.

This year there was no question about fulfillment of the annually quoted purpose of the Long Island Potato Tour, namely, "To bring about a better understanding between the farmer who produces seed potatoes, the dealer who handles them and the farmer who grows table stock from them.

—E. V. HARDENBURG.

I am enclosing for your information a preliminary estimate of the acreage under inspection. I have made several short trips for purposes of inspecting early planted potatoes. I find that in general seed has been planted somewhat earlier than in previous years and the rate of growth has been also greater than usually was the case, so that the crop is now considerably more advanced than is usual. In some sections a considerable part of the acreage was destroyed by wet weather in the early part of the season, but most of the potatoes were not affected by this as they were either planted later or in parts of the State where this condition did not occur. I have not seen any cases of sprout tuber formation and think that the stand in general is good.

ACREAGE TO BE INSPECTED

VARIETY	Acres entered for inspection		Acres disqualified by sample plot inspection	
	1930 Final	1931 Estimate	1930	1931
Green Mountain	1094	1200	57	94
Smooth Rural	900	810	27.5	7
Russet Rural	668	600	9.5	0
Irish Cobbler	301	380	10.5	2
Miscellaneous	24	80	0	29
Total	2987	3070	104.5	132

—KARL H. FERNOW.

COLORADO

We have entered for certification in Colorado 1,117 acres and 145 growers. This is just about double what we had last year when we had 559 acres entered. Conditions to date have been extremely unfavorable because of the extremely dry weather and the severe drouth of the present time. We have had more withdrawals to date than in any other season during the last seven years. We have had no rain for six weeks and the irrigated sections are suffering as well as the non-irrigated sections because of the shortage of stored water, due to the extremely dry winter.

Yields have also been cut considerably in the higher altitudes by frosts which occurred on July 4 and July 6. Although we

have double the acreage of last year, present indications are that the crop of seed for sale will not exceed that of last year. These conditions apply, of course, not only to the certified seed crop but to the potato crop in general, as most of our certified seed is grown in our regular potato districts. The San Luis valley has an increase of 10,000 acres, but is it very doubtful if they will harvest more than 50 per cent of a crop, even if they are fortunate enough to get rain in the next week or so. The general practice down there is to irrigate the ground before planting. Water was not available for this purpose this year, and the potatoes were planted in dry soil. As a result, stands are extremely poor, the temperature during June was abnormally high, and the potatoes have not done well at all.

The government report for July, shows an increase of 20,000 acres in Colorado over last year. Even if conditions do improve in August, which condition we generally expect, the crop will not be benefited as much as in former years because of the very poor stands.

—C. H. MEZGAR.

MICHIGAN

The condition of the Michigan crop varies considerably at this time. In norther counties the rainfall has been sufficient to produce vigorous vine growth and normal tuber setting. In some central and southern counties potatoes have suffered from drought and heat, many growers report good top growth but poor setting of potatoes. Poor stands are reported in those areas that were hit hardest by dry weather in the 1930 season. Many lots of seed lacked the vitality to produce normal plants.

Earlier planting was generally practiced this year throughout the state. Growers believe that planting early will improve the quality of the crop by getting it better nurtured. Furthermore, severe losses were experienced last fall by late harvesting which resulted in much chilled and frozen stock. Earlier planting will permit earlier digging and growers are planning to get potatoes out of the ground this fall before severe freezes occur.

The certified seed acreage this year is practically the same as in 1930. The Russet Rural variety constitutes the bulk of the certified crop. Seed fields are in good condition at this time, though many of them are in need of rain.

—H. C. M.

NORTH DAKOTA

The general potato crop in North Dakota is likely to be somewhat lower this year than last year. The acreage is probably about average or slightly better, but excessively dry weather during the spring and early summer has caused a very poor stand.

Regarding certified seed potatoes we feel that the crop will be probably about 20% less this year, due principally to dry weather as above stated as well as to certain eliminations which were made this year by stricter certification rules and inspection work. The decreases will be principally in the Bliss Triumph variety.

—E. M. Gillig

MAINE

Our entries for this year by varieties compared with those of last year are as follows:

	1931	1930
Green Mountains	7,329	6,448
Irish Cobblers	5,718	4,677
Spaulding Rose	1,921	1,661
Other Varieties	375	310
	<hr/> 15,343	<hr/> 13,096

Have just returned from Aroostook County and, while there are some misses due to heavy rains in some sections, I can't see any good reason now why we won't make an average crop. The crop is spotted some but on the whole Maine will raise more potatoes than ever before, I am sure. The acreage is increased 8% and the quality of the seed is exceptionally good due to the fact that last year the aphid colony was not large enough to cause a heavy spread of plant diseases. We are about two weeks ahead of last year in our inspection work and will finish our first inspection by the 25th. If the market warrants, we will be able to put early Cobblers on the market any time after August 5th.

—E. L. Newdick

MINNESOTA

According to the official crop estimates, there is a slight increase in the Minnesota potato acreage this year, and up to the middle of July prospects are much better for a greater yield of potatoes than was obtained in 1930. This is particularly true of the northern sections of the State and on all of the peat bogs. The southern part of the State and that region adjacent to the Twin Cities known as the sand land district, however, have not fared so well. The sand land district comprises a considerable acreage, and except for the stock being grown on the peat bogs scattered throughout the area, practically all of the fields suffered a great deal as a result of the long, hot, dry spell during the latter part of June and the first few days in July. Then we had about ten days of ideal potato growing weather, except for lack of rain. Just at present we are going through another hot spell

and still no rain, so that it is quite likely that the production of potatoes in this region will be greatly reduced and the quality greatly impaired.

Not only have the two hot spells and the lack of moisture affected the crop, but stands are poorer than usual. This condition is undoubtedly due to the dry season of 1930 coupled with the fact that a great deal of the seed planted was produced under most unfavorable conditions last year. Much of the stock planted was produced locally in 1930, and a great deal of it showed discolored flesh ranging in degree from scattered necrotic areas to general discoloration throughout the tubers. Complaints regarding these discolored tubers began coming into the office shortly after digging started last fall, and a series of tests of this stock was run in the greenhouse to determine the effect on the vitality of the tubers. In every case the badly discolored tubers rotted completely in the soil and those with lesser discoloration, in general, produced weak plants. Tubers showing a few necrotic spots seemed to produce normal sprouts. As a result of these tests a warning was issued, advising against the use of such seed and suggesting a sprout test be made of all stock showing any discoloration whatever.

Monday of this week I made a trip to Princeton, 50 miles north of the Twin Cities, and observed only two real promising fields of potatoes on the way. Both of these fields must have been planted with fairly good seed, but even so they can hardly be expected to come through in good shape, even if rain occurs now.

	Acres inspected for certification 1931	Acres inspected 1930	Acres passed 1930
Bliss Triumph _____	514.25	783.0	735.8
Irish Cobbler _____	2942.50	2860.0	2231.9
Early Ohio _____	911.00	707.0	580.8
Russet Burbank _____	4.75	12.5	5.5
Rural New Yorker _____	14.00	12.5	10.0
Green Mountain _____	9.00	54.0	46.5
White Rose _____	16.00	3.5	3.5
Total _____	4411.50	4432.5	3622.0

Total number of fields listed for inspection:

1931 _____ 260

1930 _____ 243

July 15, 1931.

—A. G. TOLAAS.

IDAHO

According to our present records, acreages for which certification has been requested, are as follows:

Varieties	Acreages	
	1930	1931
Netted Gems	2,382	3,032
Idaho Rurals	130	149
Bliss Triumphs	57	111
Irish Cobblers	105	251
Early Ohios	37	50
Totals	2,711	3,593

The inspection work has just begun so it is impossible, as yet, for us to have any definite information in regard to the crop condition as a whole. Our water conditions here in the state are none too good, especially in southern Idaho. Mr. Wicks of the State Department of Agriculture states the non-irrigated districts in northern Idaho are in rather better condition as they have had rain, and those who cultivate their land will be in a position to harvest normal crops. Irrigated sections around Lewiston in northern Idaho are short of water; normally they have around 18 inches but have been cut to 12 inches.

—E. R. Bennett

CANADA

The Federal Bureau of Statistics estimates that the acreage planted to potatoes is 576,200 acres, an increase of 1% over the 1930 plantings of 571,300. Quebec and Ontario report a 2% to 3% increase, Alberta a 5% increase, while other provinces report about the same to slightly decreased acreages. In Manitoba and the southern parts of Saskatchewan and Alberta continued drought greatly retarded growth, in the northern sections, however, growth is satisfactory although retarded earlier in the season by cool weather. Other provinces report that growing conditions are mostly favorable.

Preliminary reports received relative to the condition of the crop would indicate satisfactory growing conditions except in parts of the middle west where the crop suffered from dry conditions early in the season.

A final checkup on the figures of shipments of certified seed potatoes show that a total of 2,414,740 bushels of officially tagged seed was disposed of from the 1930 Canadian crop. This constitutes our best record since the inspection work was started.

SEED POTATO CERTIFICATION

Comparative Statement—1930 & 1931 (preliminary) entries.

Province	Number of Applicants	Number of Fields Entered	Number of Acres Entered
Prince Edward 1930.....	3,906	5,489	24,874
Island 1931.....	3,998	5,675	25,004
Nova Scotia 1930.....	233	383	510
1931.....	310	450	1,001
New Brunswick 1930.....	340	586	2,750
1931.....	544	800	5,335
Quebec 1930.....	1,567	2,019	3,169
1931.....	1,728	2,149	3,235
Ontario 1930.....	451	577	1,786
1931.....	507	629	2,197
Manitoba 1930.....	50	95	348
1931.....	51	91	577
Saskatchewan 1930.....	88	136	258
1931.....	83	121	304
Alberta 1930.....	79	146	174
1931.....	143	254	372
British Columbia 1930.....	156	276	436
1931.....	165	260	510
Total 1930.....	6,870	9,707	34,305
1931.....	7,529	10,429	38,535

Increase in number of applicants 1931 over 1930—659 or 9.6%.

Increase in number of acres entered 1931 over 1930—4,230 or 12.3%.

SEED POTATO CERTIFICATION

Acres Entered—By Varieties—Preliminary Statement, 1931.

	Cobblers	G. M.	Bliss	Rural	Others	Total
P. E. I.	12,191	12,155	370	-----	288	25,004
N. S.	625	150	120	-----	106	1,001
N. B.	694	3,211	1,416	-----	14	5,335
Que.	367	2,660	-----	148	60	3,235
Ont.	586	110	-----	1,495	6	2,197
Man.	308	37	-----	8	224	577
Sask.	121	52	2	-----	129	304
Alta.	19	5	150	-----	198	372
B. C.	40	14	6	-----	450	510
Total	14,951	18,394	2,064	1,651	1,475	38,535
1930	16,757	13,936	928	1,217	1,467	34,305

—JOHN TUCKER.

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